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AN EMPIRICAL EXAMINATION OF SBA GUARANTEED LOANS: RATES, COLLATERAL, AGENCY COSTS, AND THE TIME TO OBTAIN THE LOAN

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ABSTRACT

We empirically examine a sample of over 350 entrepreneurial firms that successfully receive an SBA guaranteed loan. The first portion of the paper contains descriptive statistics that lend anecdotal evidence concerning the organization type of borrowers, the incidence of collateral, the reasons for choosing the financial institution in which the SBA loan is secured, the main purpose for the SBA loan, and alternative actions that would have been undertaken had the SBA guaranteed loan not been obtained. The second portion of the paper poses theoretical predictions and tests them via multivariate models. Issues that are considered include the number of days required to obtain the SBA loan, management assistance services, agency theory, interest rate determinants, and collateral determinants.

I. INTRODUCTION

Several articles have been published using the National Survey of Small Business Finances (NSSBF) prepared by the Federal Reserve and the Small Business Administration (SBA). These studies use either the NSSBF survey conducted in 1988 or the survey conducted in 1993. Petersen and Rajan (1994), Berger and Udell (1995), and Cole (1999) all investigate relationship lending between small firms and banks. They all conclude that there is value in building banking relationships. Ang, Cole and Lin (2000) use the newer NSSBF survey to test the agency theory predictions of Jensen and Meckling (1976). Ang, et al. (2000) find support for various agency predictions based upon ownership structure and external monitoring variables. Finally, Brau (2000) uses the newer survey to test the impact of the agency variables in Ang, et al. (2000) on the loan rate and the requirement of collateral. All of these studies are similar in that they all contribute to our understanding of small firm finance. They are also similar in that they all use the general portion of the NSSBF survey as the base sample. Although not included in the newer NSSBF survey, the earlier survey contains a subsample of firms that received SBA guaranteed loans in 1986. This sample has been virtually ignored in the papers mentioned above.

In this paper, we conduct a rigorous analysis of the SBA sample of the 1988 NSSBF survey. Our intent is two-fold. First, we provide detailed descriptive statistics of the firms that obtained the loans. These statistics include the organization type of borrowers, the incidence of collateral, the reasons for choosing the financial institution in which the SBA loan is secured, the main purpose for the SBA loan, and alternative

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actions that would have been undertaken had the SBA guaranteed loan not been obtained. Second, we empirically analyze the determinants of: i) the time to obtain the SBA loan, ii) measures of firm agency costs, iii) the rate charged on the SBA loan, and iv) the incidence of collateral with the SBA loan.

In this study, we pose the following research questions:

Do SBA guaranteed loans reduce the need for entrepreneurs to pledge personal collateral?;

Is the availability of SBA loans and SBA loan institutional assistance an important reason why entrepreneurs choose a specific lender to borrow from?;

Do SBA guaranteed loans offer a source of seed financing?;

What determinants impact the time it takes for an entrepreneur to obtain an SBA guaranteed loan?;

Is management assistance services use correlated with the time to obtain an SBA loan, the rate of the SBA loan, or the requirement of collateral in the SBA loan?;

Do firms that obtain SBA guaranteed loans display the same agency costs as other firms?;

What determinants impact the SBA loan rate?; and

What determinants impact the requirement of collateral in SBA loans?

Our results indicate that SBA guaranteed loans do reduce the need for entrepreneurs to pledge personal collateral. Additionally, we find that entrepreneurs, to a large degree, choose the financial institution to borrow from based upon the availability of SBA guaranteed loans and SBA loan assistance. We provide evidence that many of the SBA loans in our sample represent seed financing and that management assistance services are not significantly correlated with the three loan characteristics stated above. Additionally we find that agency costs for the firms in our sample are not correlated with proxies for owner-manager separation and monitoring. Finally, we find many significant determinants that impact the time to obtain the SBA guaranteed loan, the rate of the loan, and the requirement of collateral.

The remainder of this paper is outlined as follows. Section II contains the data and descriptive statistics. In Section III, we describe the empirical tests and report the results. Section IV is the summary and conclusion.

II. DATA

We obtain the majority of the data for this study from the NSSBF 1988 survey. The NSSBF survey was conducted for the Board of Governors of the Federal Reserve System and the SBA. The target population for the SBA sample of the survey is all nonfinancial, nonfarm small businesses that received SBA-guaranteed loans in 1986 and were in operation as of December 1987. The NSSBF SBA sample size is 390 firms. We obtain the survey results from the Federal Reserve web site and begin with a sample of 369 firms.

A second source of data for our study is the historical monthly prime rates for 1986. We obtain these data from the Federal Reserve Bank of St. Louis website (i.e., Federal Reserve Economic Data (FRED) site).

Descriptive Statistics

Selected descriptive statistics for the sample are given in Table 1. Panel A describes the ownership structure and age of the firm. The family owned indicator variable equals one when the firm is either a proprietorship or more than 50% of the firm is owned by a single family and zero otherwise. Eighty-four percent of the sample has a value of one. The owner-manager indicator equals one when the owner manages the firm and zero otherwise. Eighty-eight percent of the sample has a value of one. The next variable in Panel A indicates that the average firm is approximately 16 years old. Finally, the average number of employees in the sample firm is 13 with a maximum of 120, all clearly qualifying as a "small business" under the SBA cap of 500 employees.

Panel B reports various bank and loan characteristics. The bank and S&L concentration variable is a herfindahl index that measures the geographical concentration of commercial bank and savings and loan deposits. This variable represents three divisions of concentration that can be thought of as heavy, normal, and light. The number of years the firm has done business with the lending institution averages 6.2 for the

Table 1
Descriptive Statistics for Sample of 1986 SBA Guaranteed Loan Recipients

Variable	N	Mean	Std Dev	Minimum	Maximum
Panel A. Firm characteristics					
Family owner dummy	369	0.84	0.37	0	1
Owner-manager dummy	369	0.88	0.32	0	1
Age of firm (years)	369	15.67	21.66	0	175
Number of employees	365	13.24	16.92	1	120
Panel B. Bank/loan Characteristics					
Bank and S&L concentration	369	1.86	0.80	1	3
Lending years relationship	365	6.19	7.22	1	50
Loan amount ($)	309	116,508	176,964	1,600	1,300,000
Loan term (months)	301	73.36	71.83	0	360
Loan rate (%)	233	10.91	1.98	4.75	18
Panel C. Financial ratios					
Operating Profit ($)	361	80,109	447,825	-536,681	7,245,000
Total Assets ($)	369	458,339	602,732	2,000	5,222,000
Total Liabilities ($)	369	334,046	452,458	0	4,378,641
Market Value ($)	310	709,183	1,074,274	0	10,000,000
Book Value ($)	369	124,293	228,863	-450,801	1,934,000
Sales ($)	369	1,004,986	1,446,460	20,000	14,268,124

sample. Next Panel B reports that the average loan amount is $116,508 for an average term of 73 months at an average rate of nearly 11%.

Panel C reports six financial variables for the borrowing firms. The average firm in the sample has operating profits of $80,109 on an average $1,004,986 in sales revenue. Balance sheet items indicate total average assets of the sample as $458,339 and total average liabilities as $334,046. Market value of the firm is reported at approximately 6 times that of book value of the firm; however, the large majority of these small firms are not publicly traded and the market values are estimated by the owners. Thus, the reliability of the market value estimate may be in question.

The industry breakdown of the sample is reported in Table 2. This table uses the same industry classifications as Table I of Petersen and Rajan (1994). The SBA sample is dominated by Retail Trade (37.4%), Services (27.6%), and Manufacturing (15.7%). The same three industries are heavily represented in Petersen and Rajan (1994). The main exception to this observation of similar distributions is the construction sector which represents 13.1% of the Petersen and Rajan (1994) sample and only 5.4% of the SBA sample. These industry comparisons are for description only. The NSSBF documentation states that the overlap between the main sample (i.e., that used in Petersen and Rajan (1994)) and the SBA sample are unknown and that it is not possible to derive weights for combining the samples. The documentation continues to warn that the two samples should not be analyzed jointly. We make no attempt to construct a weighting scheme that allows for joint comparisons and limit our comparisons between the two samples to casual observation only.

The next set of descriptive statistics is reported in Table 3. The sample is composed of 119 (32.2%) Proprietorships, 19 (5.1%) Partnerships, 53 (14.4%) S-corporations, and 178 (48.3%) C-corporations. These

Table 2.
Industry Classification Frequency of SBA Guaranteed Borrowers

Industry	Frequency	Percent
Mining	0	0
Construction	20	5.4
Manufacturing	58	15.7
Utilities and Transportation	13	3.5
Wholesale Trade	36	9.8
Retail Trade	138	37.4
Insurance and Real Estate	2	0.5
Services	102	27.6

proportions are practically identical to those reported in Table II of Haynes (1996) who uses the 390 firm NSSBF SBA sample. Thus it appears the 21 firms that are excluded from our sample are approximately equally distributed in the four ownership classifications.

The final descriptive statistics in this preliminary section are reported in Table 4. Panel A lists the six classifications of loans reported in the NSSBF. Our sample has a fairly equal distribution of lines of credit, mortgages, vehicle loans, and equipment loans each at approximately 20%. Only one firm is granted a lease

Table 3.
Organization Type of SBA Guaranteed Borrowers

	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Organization type				
Proprietorship	119	32.2	119	32.2
Partnership	19	5.1	138	37.4
S-Corporation	53	14.4	191	51.8
C-Corporation	178	48.2	369	100

in our sample and the remaining 15% of the loans are classified as "other".

Panels B and C report the incidence of collateral. Even with the SBA guarantee, 88% of the loans require collateral. Intuitively, mortgages, vehicle, and equipment loans are associated with collateral. These account for approximately 65% of the loans. Also of interest, Panel C reports the requirement of personal collateral. A potential benefit of an SBA guaranteed loan might be a reduction of personal risk exposure by entrepreneurs. Specifically, the SBA guarantee may mitigate the requirement of personal collateral. Our sample indicates that only 6% of the owners had to pledge personal collateral which is in stark contrast to the results reported in Ang, Lin and Tyler (1995). Using the general sample of the 1988 NSSBF survey, Ang, et al. (1995) report that over 27% of the owners in their sample must pledge personal collateral (i.e., either personal real estate or other personal assets). We compute the 27% figure using a weighted average of the first two rows in the Ang, et al. (1995) Table 1, Panel B. Although it is not possible to compute statistical tests

Table 4.
Loan Type and Collateral Requirements of SBA Guaranteed Loans

	Frequency	Percent
Panel A. Loan Type		
Line of credit	64	20.3
Mortgage	66	21.0
Vehicle	63	20.0
Equipment	75	23.8
Lease	1	0.3
Other	46	14.6
Panel B. Any collateral secures loan		
No	274	88.1
Yes	37	11.9
Panel C. Personal collateral secures loan		
No	341	93.9
Yes	22	6.1

between the two samples without a weighting scheme, it appears that one direct benefit of the SBA guarantee to entrepreneurs is that the guarantee limits personal risk exposure.

III. EMPIRICAL TESTS AND RESULTS

In this section, we test the research questions posed in the first section of the paper. We use the variables that are reported in the descriptive statistics section as well as others to rigorously analyze the characteristics of SBA guaranteed loans.

Choosing the Lending Institution

One measure of the efficacy of SBA loans is the ranking of the reasons why entrepreneurs chose their specific lender. Table 5 reports the top 15 first reasons (Panel A) and the top 15 second reasons (Panel B) why the borrowing firm chose the institution in which it did. When asked the primary reason the entrepreneur chose its specific lender, Panel A reports that nearly 14% responded with its location as the top reason. The next three reasons provide further evidence of the value of relationship lending and adds to the studies of Petersen and Rajan (1994), Berger and Udell (1995), and Cole (1999). The survey contains two reasons that relate to SBA loans. The first is the availability of the SBA loan, which ranks sixth with just over 5% of the responses. The second reason is that the institution helped the firm obtain the SBA loan, which accounts for nearly 3% of the responses and ranks as the tenth first reason entrepreneurs chose their lender. Both of these SBA responses are in the top ten and combined encompass nearly 8% of the total responses. In the aggregate, SBA reasons rank as the third most important reason for lender choice.

When asked the second reason that determined their choice of institution, entrepreneurs listed availability of SBA loans as the third reason (5.8%) and that the institution helped them obtain the SBA loan as the 13th reason (2.9%) (Panel B). In the aggregate, SBA reasons comprise 8.7% of the responses which rivals the top reason of location (which received 8.8% of the responses). The results reported in Table 5 suggest that SBA factors are important determinants of whether a borrowing firm chooses a specific institution.

Intentions of the Firm Acquiring an SBA Guaranteed Loan

In this section, we discuss the intentions and characteristics of the borrowing firms in the sample. One of the highest hurdles entrepreneurs face is acquiring seed capital. This seed capital may take several forms. Some of the sources of seed capital are venture capital (e.g., Barry, et al. (1990), Megginson and Weiss (1991), and Brav and Gompers (1997)), angel financing, small corporate offering registrations (SCORs) (Brau and Osteryoung (2000)), personal capital (Van Auken and Carter (1989)), and bank financing (Justis (1982)). One of the purposes of the SBA is to assist entrepreneurs in the acquisition of seed capital (Bates (1974) and Haynes (1996)). Table 6 reports the survey results of whether the SBA loan obtained by the firm in 1986 was the first loan the borrower ever obtained from a financial institution. Over 60% of the sample indicates that this SBA loan is their first institutional loan. If we assume that first time loans serve as a proxy for seed capital, then this result lends evidence that the SBA is providing access to seed capital for entrepreneurs.

As a further refinement of the measure reported in Table 6, Table 7 reports the main purpose of the SBA loan. In support of the SBA mission to assist entrepreneurs in obtaining seed capital, the most popular purpose of the SBA loan is to start the business (44.4%). Next, over 33% of the sample responds that the SBA loan is used to expand an existing business. Also of interest, only 10% of the firms report that the SBA loan is to help the firm remain solvent. Thus it appears that the majority of entrepreneurs are not using the SBA loans out of a desperate attempt to stay in business, but to begin and grow their business. Tables 6 and 7 support the notion that the SBA does assist in providing access to seed capital for entrepreneurs.

Another interesting question that tests the efficacy of the SBA guaranteed loan program is what the firms in the sample would have done had they not been able to obtain the SBA guaranteed loan. Table 8

Table 5.
Reasons for Choosing Financial Institution at Which SBA Loan is Secured

Panel A. The top 15 first reasons

Rank	Reason	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	Location, proximity	49	13.8	49	13.8
2	Started with institution, long-term relationship, familiarity	30	8.4	79	22.2
3	Owner has personal or other business with institution	28	7.9	107	30.1
4	Owner knows officers or employees of institution	23	6.5	130	36.6
5	Availability of credit, only institution to give credit	22	6.2	152	42.8
6	Availability of SBA loans	18	5.1	170	47.9
7	Convenience – Not ascertained	17	4.8	187	52.7
8	Other recommendation	13	3.7	200	56.4
9	Local, institution's participation in community	11	3.1	211	59.5
10	Helped firm obtain SBA loan	10	2.8	221	62.3
11	Only institution in town	10	2.8	231	65.1
12	Dissatisfaction with previous institution	8	2.2	239	67.3
13	Willing to work with firm, flexibility	8	2.2	247	69.5
14	Previous loan	7	2	254	71.5
15	Firm was using institution when acquired	7	2	261	73.5
16	All other responses	95	26.5	356	100.0

Panel B. The top 15 second reasons

Rank	Reason	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	Location, proximity	12	8.8	12	8.8
2	Started with institution, long-term relationship, familiarity	9	6.6	21	15.4
3	Availability of SBA loans	8	5.8	29	21.2
4	Owner knows officers or employees of institution	7	5.1	36	26.3
5	Local, institution's participation in community	6	4.4	42	30.7
6	Services – not ascertained	6	4.4	48	35.1
7	Always meets needs, reliable	6	4.4	54	39.5
8	Friendly/good treatment, like the people	6	4.4	60	43.9
9	Personal service, deals with one person, access	6	4.4	66	48.3
10	Availability of credit, only institution to give credit	5	3.6	71	51.9
11	Quality of services	5	3.6	76	55.5
12	Willing to do business or take risk with small business	5	3.6	81	59.1
13	Helped firm obtain SBA loan	4	2.9	85	62
14	Soundness, safety, financial health of institution	4	2.9	89	64.9
15	Low or competitive prices – not ascertained.	4	2.9	93	67.8
16	All other responses	44	32.2	137	100.0

reports the results of this question. The majority of the firms (37.1%) report that they would have obtained similar financing elsewhere. The second row indicates that 19.5% would have obtained financing elsewhere with less favorable terms. Thus, the majority of the entrepreneurs are confident that they could obtain the needed external financing had the SBA guaranteed loan not been approved. In contrast, 14.1% of the firms

Table 6.

SBA Guaranteed Loan is First Business Loan

This SBA loan was the first loan the firm obtained from a financial institution

	Frequency	Percent
Yes	222	61.3
No	133	36.7
Denies having a loan	7	1.9

Table 7.
Main Purpose of the SBA Guaranteed Loan

Main purpose of SBA loan

	Frequency	Percent
Start the business	157	44.4
Expand the business	119	33.6
Stay in the business	35	9.9
Other	43	12.1

would have discontinued expansion plans, 16.2% of the firms would not have been able to open, and nearly 6% state they would have gone out of business. It is important to note that well over half of the sample (62.9%) would have incurred a cost had they not obtained the SBA guaranteed loan. These results suggest that SBA loans are valuable to entrepreneurs.

Table 9 reports entrepreneur responses to the question of whether they have applied for a loan since receiving the SBA loan. This question informs us if the SBA loan with its $116,000 average principle for the sample is sufficient in meeting the borrowers' external financing needs. Nearly half (46.9%) of the borrowing firms report that they have sought additional loans between the time they received the SBA guaranteed loan in 1986 and the time the survey was administered between 1987 and 1988. This result indicates that the SBA loans did not provide the sufficient capital needed for at least half of the firms in the sample. It is important to note however, that an additional need for external capital may have surfaced in the period of time between the SBA loan and the survey and the borrower may have acquired all of the debt financing it was seeking at the time of the SBA loan. Thus it is not possible from the data to determine if borrowers were simply denied the full amount of their requested loan or if the additional need developed after the initial SBA loan was obtained.

Number of Days to Obtain the SBA Loan

Haynes (1996) reports that over 90% of all loan guarantee applications submitted to the SBA are

Table 8.

Alternative Financing Actions

Action firm would have taken had SBA loan not been obtained

	Frequency	Percent
Obtained similar financing elsewhere	124	37.1
Obtained financing elsewhere with less favorable terms	65	19.5
Discontinued expansion plans	47	14.1
Not opened	54	16.2
Gone out of business	19	5.7
Other	25	7.5

approved and infers that the evaluation procedures employed by the lender are the most important. He also states that if a lender uses the SBA guarantee program frequently enough to be classified as a preferred lender then no SBA review is required. If the lender is not preferred, then the SBA review process may take from two to fourteen days. In this section, we report the time it takes the borrowing firms to obtain their loans. Additionally, we estimate a multivariate regression model to explore the determinants of the time delay in obtaining the loan. These findings may be of help to entrepreneurs who wish to limit the wait between the time of application and approval of SBA loans.

Figure 1 contains a chart of the number of days each loan took to process. The most common period is 60 days (16.8%). The second most common response is 90 days (15.6%). The remaining responses are distributed between 7 days (10 firms) and 730 days (6 firms). The sample is divided exactly in half at the 63-day mark. Assuming that the 0-14 day SBA time period reported in Haynes (1996) is correct, then the lending institutions take approximately 1.5 to 2 months to process the loan.

In an attempt to examine the determinants of the time to process the loan, we estimate a tobit regression model. It is necessary to use a tobit methodology because the dependant variable is truncated at zero. The model is specified as:

$$\textit{Number of days} = \alpha + \Sigma_{i=1,4}\beta_i\ \textit{Firm's use of loan variables} + \Sigma_{i=5,7}\beta_i\ \textit{Firm characteristics} + \Sigma_{i=8,12}\beta_i\ \textit{Bank \& loan characteristics} + \Sigma_{i=13,16}\beta_i\ \textit{Financial ratios} + \Sigma_{i=17,19}\beta_i\ \textit{Ownership structure variables} + \Sigma_{i=20,23}\beta_i\ \textit{Type of loan variables} + \Sigma_{i=24,28}\beta_i\ \textit{industry variables} + \varepsilon, \quad (1)$$

where the dependent variable is the number of days required to obtain the loan and the specific independent variables are as listed in the first column of Table 10.

For each independent variable, we discuss the theoretical prediction for the sign of the coefficient and then report the results from the estimated model. The first loan dummy variable equals one when this is the firm's first loan from a financial institution and zero otherwise. If we assume there is a learning curve to applying for and obtaining a loan, then it follows that first time borrowers will take longer to acquire the loan. The empirical prediction is that the coefficient for the first loan dummy will be positive and significantly different than zero. The estimate for the coefficient reported in Table 10 supports this finding with statistical

Table 9.
Additional Loan Applications Following SBA Guaranteed Loan

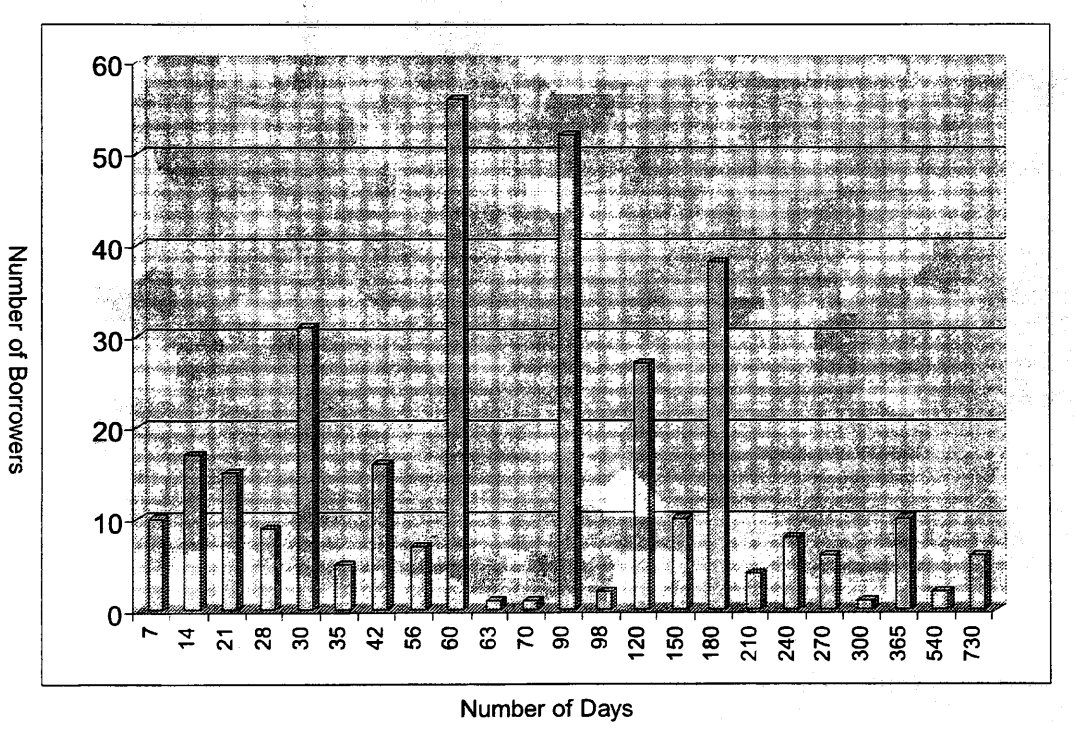
Firm has applied for a loan since receiving the SBA loan

	Frequency	Percent
Yes	168	46.9
No	190	53.1

significance beyond the one percent level.

The three loan-use indicator variables that follow equal one if the condition listed in Table 10 is met and zero otherwise. The variable that is omitted is the indicator that the firm is acquiring the loan to start the business. The expand the business dummy variable is predicted to be negative, as more established firms should be higher on the lending learning curve. The stay in business indicator is predicted to be positive as we expect firms in financial distress will be more heavily scrutinized by lenders. Both of the coefficients for

Figure 1.
Number of Days Needed to Obtain an SBA Guaranteed Loan



these variables have the expected sign, however they are not statistically different from zero. The other use dummy is included in the regression so the intercept will cleanly capture the omitted start the business

Table 10.
Tobit Regression of the Number of Days to Obtain an SBA Guaranteed Loan

	Estimated Coefficient	Standard Error	Chi Square	p-value
Intercept	-100.57	28.45	12.50	0.0004
Firm's use of loan				
First loan dummy	23.82	4.51	27.89	0.0001
Expand business dummy	-1.93	5.62	0.12	0.7314
Stay in business dummy	11.04	7.37	2.24	0.1342
Other use dummy	-7.38	5.86	1.59	0.2079
Firm characteristics				
Owner-manager dummy	-3.72	5.87	0.40	0.5261
Family ownership dummy	-16.03	4.95	10.48	0.0012
Age of firm	-0.48	0.08	38.12	0.0001
Bank/loan characteristics				
Bank/S&L Concentration	-0.71	2.33	0.09	0.7601
Lending relationship length	0.30	0.27	1.24	0.2654
Loan amount	8.E-05	0.00	21.63	0.0001
Loan term	-0.08	0.04	4.66	0.0308
Collateral Dummy	25.89	6.64	15.21	0.0001
Financial ratios				
Operating profit	-6.E-06	0.00	1.98	0.1597
Log of total assets	15.61	2.19	50.80	0.0001
Times interest earned	0.13	0.18	0.52	0.4715
Debt to equity ratio	-0.08	0.06	1.81	0.1784
Ownership structure				
S-corporation dummy	16.22	5.59	8.41	0.0037
Partnership dummy	53.22	11.58	21.10	0.0001
C-corporation dummy	23.95	4.62	26.86	0.0001
Type of Loan				
Mortgage	0.95	7.42	0.02	0.8984
Vehicle	-34.86	6.37	29.93	0.0001
Equipment	-28.58	6.13	21.75	0.0001
Other loan type	15.46	6.45	5.75	0.0165
Industry Variables				
Construction	-70.72	8.17	74.89	0.0001
Manufacturing	-25.06	5.75	18.98	0.0001
Retail	6.63	4.79	1.92	0.1656
Wholesale	-19.87	6.80	8.53	0.0035
Transportation	-5.62	8.88	0.40	0.5268

dummy variable and is not significant.

The next group of regressors represents various firm characteristics. The first two are used to serve as proxies for potential agency costs. Jensen and Meckling (1976) argue and Ang, et al. (2000) show that firms with outside managers experience greater agency costs than those with owner-managers. Additionally, firms that are owned by one family may have greater monitoring and thus decreased agency conflicts. If

potential agency costs raise a red flag for borrowers, then it follows that loans to firms that display high agency possibilities may require more rigorous scrutiny. Therefore we predict the coefficients of both the owner-manager dummy and the family ownership dummy to be negatively related to the number of days required to obtain the loan. Table 10 reports that both of these variables have the predicted sign, but only the family ownership dummy is statistically significant ($p = 0.0012$).

The final variable in the firm characteristic category is the age of the firm. Firms with an established track record may pose less risk and may be easier to evaluate by lending officers. Thus we predict that the coefficient of firm age will be inversely related to the number of days to acquire the loan. The empirical results indicate that the coefficient is negative and significantly different from zero beyond the one percent level.

Continuing down the first column in Table 10, the next group of regressors is the bank and loan characteristic variables. The bank and S&L herfindahl index measures the geographical concentration of deposits in institutions servicing the borrowing firm. We predict that areas with more concentration will have institutions that are forced to be efficient in the competitive environment. Thus we predict an inverse relationship between the concentration metric and the number of days to acquire the loan. Empirically, the sign of the coefficient is correct, however it is not significantly different from zero.

Petersen and Rajan (1994), Berger and Udell (1995), and Cole (1999) find evidence that lending relationship contain value. The next variable extends their tests to determine if the length of the lending relationship benefits a borrower by decreasing the number of days it takes to acquire the SBA guaranteed loan. We predict a negative relationship between the lending relationship length and the number of days to acquire the loan. Table 10 reports that the coefficient is positive, contrary to our prediction, however it is not significantly different from zero. This finding suggests that although lending relationships are of value in certain other areas (e.g., loan rates and credit availability) the length of lending relationship does not shorten the number of days required to obtain an SBA loan.

The next variable we consider is the loan amount. Intuitively, the larger the loan amount, the more risk the lending institution assumes. Additionally Hancock and Wilcox (1998) report that the SBA guarantees 80% of loans up to $100,000 and only 75% of loans over $100,000. Thus, lending institutions incur more risk for the unsecured portion of larger loans. As a result, we predict that borrowers who request larger loans must wait longer for loan approval while lenders screen them more carefully. The empirical findings support this prediction with a coefficient on the loan amount variable positive and significant beyond the one percent level.

The loan term (i.e., length of loan) variable is considered next. Loans with longer maturities force the lending institution to incur more risk, as there is a greater probability of default over the period of the loan. We therefore predict a positive relationship between the loan term and the number of days required to obtain the loan. The empirical findings are contrary to our prediction. Hancock and Wilcox (1998) report that the SBA loan guarantee program is primarily intended to promote longer-term small business financing. One possible explanation for the empirical loan term result is that the SBA may give a higher priority to longer-term loans to fulfill this objective.

The final loan characteristic variable is the collateral dummy. There are two competing predictions for this variable. First, loans that include collateral reduce the risk borne by the lender, decreasing loan scrutiny and resulting in fewer days to approve the loan. Alternatively, riskier firms may be required to offer collateral and as such will be screened more rigorously. Empirically, the latter explanation is supported. Firms that must offer collateral also must wait longer for loan approval, suggesting that they must be more heavily screened.

The next grouping of explanatory variables is the financial ratios. We include these measures to control for the financial health and debt capacity of the borrowing firm. The only coefficient that is significantly different from zero is the log of total assets, which has a positive sign, indicating that on average larger firms must wait longer for loan approval.

Next, the model incorporates the ownership structure of the firm. The three variables estimated are the s-corporation dummy, c-corporation dummy, and partnership dummy which each equal one if the firm

Table 11.

Management Assistance Services Usage and Usefulness

Panel A
Firm used SCORE for management assistance

Response	Frequency	Percent
Yes	44	12.1
No	320	87.9

Panel B
Firm used services of a SBSD

Response	Frequency	Percent
Yes	38	10.4
No	326	89.6

Panel C.
Firm used other SBA service

Response	Frequency	Percent
Yes	20	5.5
No	343	94.5

Usefulness of SCORE service to firm.

Response	Frequency	Percent
Very Useful	12	27.3
Somewhat Useful	16	36.4
Not very useful	8	18.2
Not at all useful	8	18.2

Usefulness of SBSD services

Response	Frequency	Percent
Very Useful	20	52.6
Somewhat Useful	11	28.9
Not very useful	5	13.2
Not at all useful	2	5.3

Usefulness of other SBA service

Response	Frequency	Percent
Very Useful	7	36.8
Somewhat Useful	8	42.1
Not very useful	3	15.8
Not at all useful	1	5.3

has the specific ownership form and zero otherwise. We omit proprietorships and thus the three indicator variables reported are benchmarked to proprietorships. The proprietorship is the simplest form of ownership structure and as such may be the easiest for loan officers to evaluate. Additionally, owners of proprietorships have unlimited personal liability and as such may be more careful when requesting external debt financing because additional debt increases their financial risk exposure. Following this logic, we predict the s and c-corporations and partnerships will be positively related to the number of days required to obtain the SBA guaranteed loan. Empirically, Table 10 indicates that all three variables are consistent with this prediction, all significant beyond the one percent level.

The last nine variables included in the model are additional control variables. We have specified the model so we can directly control for the type of loan and the industry of the borrower. Six of these nine variables are significantly different than zero. The type of loan variables are compared to lines of credit which are captured in the intercept. The industry variables are compared to the service industry firms. The results indicate that vehicle and equipment loans take significantly less time for the loan to process than lines of credit. The industry results indicate that construction, manufacturing, and wholesale firms all require less time to obtain the loan than service firms.

In this section, for the first time to our knowledge, we have explored many of the determinants of the time to obtain an SBA guaranteed loan. The majority of the empirical findings support the theoretical predictions we pose. These findings may be of value to entrepreneurs who wish to minimize the time it takes for them to obtain an SBA loan.

SCORE, SBSD, and other SBA Services

Much has been written on the effectiveness of the Service Corps of Retired Executives (SCORE) and the Small Business Development Center (SBSD) (e.g., Grose (1974), Lang and Golden (1989), Chrisman, Nelson, Hoy and Robinson (1985), Elstrott (1987), Wood (1994), and Chrisman and Katrishen (1994)). Studying small businesses in Georgia and South Carolina, Chrisman, et al. (1985) conclude that the SBDC program has a positive, cost-effective impact on small businesses. In a follow-up article, Chrisman and Katrishen (1994) draw the same conclusion using a national database of small firms. In this section, we report the incidence of SCORE, SBSD, and other SBA services in our sample. Additionally, we calculate Pearson correlations between each of these variables and the length of time required to obtain the loan, the interest rate charged on the loan, and the requirement of collateral.

Table 11 reports the incidence of service uses. Panel A indicates that only 12% of the firms in the sample employed SCORE and approximately 64% of the firms that used the service felt the assistance was either very or somewhat useful. Panel B indicates that approximately 10% of the borrowing firms used SBSD services and just over 80% of these entrepreneurs felt the service was useful. Finally, Panel C reports that only 5.5% of the sample used some other type of SBA service and approximately 79% of these users felt the service was useful. The results in Table 11 suggest that the borrowers in the sample feel the SBSD services are the most effective and the SCORE the least effective with other SBA services in the middle.

In an attempt to support this anecdotal evidence with empirical tests, we next perform Pearson correlations between the various services and the time it took to acquire the loan, the loan rate, and the requirement of collateral. These results are reported in Table 12. The first row for each variable is the correlation coefficient, the second row is the p-value for the null hypothesis that the coefficient is equal to zero, and the third row is the sample size. A negative correlation between the service and the time to obtain the loan, the interest rate, or the collateral requirement indicates that the service is useful and benefits the entrepreneur. The results in Panel A indicate that whether an entrepreneur uses SCORE or SBSC services, it is not significantly related to the time to obtain the loan, the loan rate, or the requirement of collateral. If the borrowing firm used some other type of SBA service, then the firm also had to offer more collateral.

Panel B reports the results of correlations between the usefulness of the assistance as judged by the entrepreneurs and the time to obtain the loan, loan rate, and collateral requirement. A positive correlation

Table 12.
Pearson Correlations of Management Assistance Programs

	TIME	RATE	COLLATERAL
Panel A			
SCORE	0.026	0.020	0.057
	0.635	0.764	0.323
	333	231	308
SBSD	-0.003	-0.053	0.093
	0.963	0.427	0.102
	334	231	309
Other SBA service	0.063	-0.038	0.105
	0.254	0.561	0.065
	333	231	308
Panel B			
SCORE usefulness	0.086	-0.025	0.251
	0.585	0.901	0.145
	43	27	35
SBSD usefulness	0.249	0.132	0.094
	0.132	0.504	0.596
	38	28	34
Other SBA service usefulness	0.357	-0.148	0.207
	0.160	0.600	0.396
	17	15	19

with time indicates that those entrepreneurs who view the service as useful experience less time to obtain the loan. A positive correlation with loan rate indicates that entrepreneurs who felt the service was useful enjoy a lower interest rate. A positive correlation with collateral indicates that entrepreneurs who felt the service was useful offer less collateral. The signs of the Pearson correlations indicate that all three services (i.e., SCORE, SBSD, and other SBA services) all benefit the entrepreneur when considering time to obtain the loan and collateral. The results also suggest that only the SBSD usefulness benefited the loan rate. Although the signs of the coefficients support the success of the advisement services, the correlations are not statistically significant. The lack of statistical power may be due to the small sample sizes in each cell.

Agency Costs Within SBA Borrowers

Ang, et al. (2000) employ the 1993 NSSBF database to test the agency cost theoretical predictions of

Jensen and Meckling (1976). They find support for Jensen and Meckling's predictions by employing two proxies to measure agency costs. The first is the ratio of operating expenses to sales and the second is the ratio of sales to assets. Ang, et al. (2000) argue that agency costs increase with the operating expense to sales ratio and decrease with the sales to assets ratio. Table 13 reports the results of an ordinary least squares (OLS) a model. The dependent variable is the operating expenses to sales ratio and the independent variables

Table 13.
OLS Regression of Operating Expenses to Annual Sales Ratio

Variable	Estimated Coefficient	Standard Error	t-stat	p-value
Intercept	0.89	0.24	3.62	0.0004
Firm's use of loan				
First loan dummy	4.E-03	0.04	0.10	0.9187
Expand business dummy	-5.E-03	0.05	-0.10	0.9230
Stay in business dummy	-0.01	0.06	-0.20	0.8393
Other use dummy	-0.02	0.05	-0.43	0.6673
Firm characteristics				
Owner-manager dummy	0.04	0.05	0.80	0.4250
Family ownership dummy	0.02	0.04	0.58	0.5644
Age of firm	0.00	0.00	-0.67	0.5009
Bank/loan characteristics				
Bank/S&L Concentration	-4.E-03	0.02	-0.20	0.8423
Lending relationship length	9.E-04	0.00	0.38	0.7070
Loan amount	8.E-08	0.00	0.75	0.4526
Loan term	6.E-05	0.00	0.21	0.8316
Collateral Dummy	0.05	0.06	0.86	0.3914
Financial ratios				
Operating profit	-3.E-08	0.00	-0.83	0.4083
Log of total assets	-4.E-03	0.02	-0.21	0.8309
Times interest earned	-5.E-03	0.00	-2.96	0.0034
Debt to equity ratio	-6.E-04	0.00	-1.21	0.2270
Ownership structure				
S-corporation dummy	0.07	0.05	1.41	0.1608
Partnership dummy	0.05	0.09	0.51	0.6096
C-corporation dummy	0.04	0.04	1.09	0.2751
Type of Loan				
Mortgage	-0.02	0.06	-0.37	0.7108
Vehicle	0.04	0.06	0.65	0.5136
Equipment	0.03	0.05	0.50	0.6185
Other loan type	0.04	0.06	0.63	0.5290
Industry Variables				
Construction	-0.66	0.07	-8.99	0.0001
Manufacturing	-0.63	0.05	-12.40	0.0001
Retail	-0.59	0.04	-14.19	0.0001
Wholesale	-0.69	0.06	-11.64	0.0001
Transportation	-0.03	0.08	-0.37	0.7137
Adjusted R-square		0.6276		
F-stat			16.047	0.0001

are listed in the first column of the table. The only coefficients that are significantly different from zero are the time interest earned and four of the five industry control variables. An indirect relationship is found between the times interest earned ratio and operating expenses to sales. This finding follows from the idea that firms that can use debt efficiently (i.e., a high times interest earned) also operate efficiently in other areas of managing the firm (i.e., low operating expenses to sales) and vice versa. It is interesting to note that the four variables used by Ang, et al. (2000) to test for agency costs (i.e., owner-manager dummy, family ownership dummy, bank & S&L concentration, and the lending relationship length) are all non-significant. One explanation for the disparity between the Ang, et al. (2000) study and our findings is the sample differences. First, Ang, et al. (2000) use the newer NSBBF database while we use the earlier survey; second, our sample contains only firms that successfully obtained a SBA guaranteed loan; and third, Ang, et al. (2000) study only corporations whereas we include all firm ownership structures. Perhaps the screening criteria to satisfy an SBA loan creates a sample bias towards strong firms. Additionally, perhaps agency costs are not realized as much in these stronger firms.

To further analyze the agency cost implications we estimate a model similar to the preceding model, substituting the sales to assets ratio as the dependent variable. Table 14 reports the results. SBA borrowers whose use of funds is to stay in business have a positive relationship with the sales to asset ratio. This finding suggests that these firms that are presumably desperate for external capital experience significantly lower agency costs than firms that require the funds to start the business. It appears the entrepreneurs who are struggling to stay in business have trimmed the fat from the business and are operating efficiently. This finding supports the idea that lenders and the SBA are able to screen well and grant loans to firms that, although they need the funds to stay in business, operate efficiently.

The only variable of the four included in Ang, et al. (2000) that is significant is the coefficient on the lending relationship length. This variable serves as a proxy of the ability of the lending institution to monitor the lender. Our model estimates a direct relationship between the length of lending relationship and the sales to asset ratio, contrary to the finding in Ang, et al. (2000). Again, the disparity of the two samples (i.e., the SBA selection bias) seems to be driving the conflicting results. Three of the control variables, one financial ratio, and three industry variables are also significant.

The main conclusion from this section is that the sample of SBA firms seems to display less significant relationships between predictor variables and agency costs than the sample studied in Ang, et al. (2000). We hypothesize that this disparity may be attributed to the different samples employed in the two studies. Our sample may be biased towards stronger firms that are able to obtain SBA guaranteed loans and thus exhibit less agency conflicts.

Determinants of the Loan Rate

In this section we explore the determinants of the interest rate charged on the loan. Prior to estimating the model, we adjust the interest rate charged on the SBA guaranteed loan with the prime-lending rate for the month in which the loan was issued. It is particularly important to do this for 1986 data because the prime rate fell from 9.5% in January to 7.5% in December. If we do not adjust for the prime rate, then we introduce error into the estimation. The rates on the loans in our sample have a lower tail truncated at the prime rate, which when the interest rate is adjusted by prime, effectively truncates the rate at zero. As a result, we estimate a tobit model with the prime-adjusted interest rate as the dependent variable and th independent variables as listed in the first column of Table 15. The findings of the estimated model provide some interesting results.

Firms that intend to use the SBA guaranteed loan to expand the business pay a higher rate of interest than firms that intend to use the external funds to start the business. This finding lends further evidence that

Table 14.
OLS Regression of Annual Sales to Total Assets Ratio

Variable	Estimated Coefficient	Standard Error	t-stat	p-value
Intercept	35.03	7.34	4.77	0.0001
Firm's use of loan				
First loan dummy	-1.35	1.19	-1.13	0.2602
Expand business dummy	1.53	1.50	1.02	0.3088
Stay in business dummy	6.21	1.94	3.20	0.0016
Other use dummy	2.42	1.55	1.56	0.1206
Firm characteristics				
Owner-manager dummy	-0.34	1.53	-0.22	0.8238
Family ownership dummy	-1.66	1.27	-1.30	0.1943
Age of firm	0.01	0.02	0.51	0.6097
Bank/loan characteristics				
Bank/S&L Concentration	0.05	0.61	0.08	0.9389
Lending relationship length	0.14	0.08	1.79	0.0746
Loan amount	3.E-06	0.00	0.89	0.3721
Loan term	-4.E-04	0.01	-0.05	0.9638
Collateral Dummy	-0.71	1.77	-0.40	0.6883
Financial ratios				
Operating profit	-2.E-08	0.00	-0.02	0.9843
Log of total assets	-2.60	0.57	-4.61	0.0001
Times interest earned	0.03	0.05	0.65	0.5198
Debt to equity ratio	0.02	0.02	1.04	0.3004
Ownership structure				
S-corporation dummy	0.07	1.53	0.05	0.9625
Partnership dummy	-1.92	2.99	-0.64	0.5216
C-corporation dummy	-1.31	1.23	-1.07	0.2874
Type of Loan				
Mortgage	-1.68	1.97	-0.85	0.3964
Vehicle	-0.88	1.71	-0.51	0.6077
Equipment	-0.15	1.65	-0.09	0.9279
Other loan type	-3.24	1.73	-1.87	0.0624
Industry Variables				
Construction	1.91	2.17	0.88	0.3798
Manufacturing	3.04	1.56	1.95	0.0526
Retail	1.84	1.27	1.45	0.1486
Wholesale	2.93	1.78	1.64	0.1023
Transportation	13.26	2.46	5.40	0.0001
Adjusted R-square		0.1723		
F-stat			2.77	0.0001

the SBA makes efforts to provide attractive seed capital to start-up enterprises.

The firm characteristics group of variables indicates that firms in which the owner is the manager must pay higher interest rates. This finding is consistent with the results of Brau (2000) who provides evidence that banks do not price potential owner-manager agency conflicts. The second variable in the firm characteristics group that is significantly different from zero indicates that older firms enjoy lower interest rates. This finding supports the idea that older firms are more established and less risky and as such enjoy

Table 15
Tobit Regression of Loan Rate for Sample of SBA Guaranteed Loans

Variable	Estimated Coefficient	Standard Error	Chi Square	p-value
Intercept	5.74	0.83	47.41	0.0001
Firm's use of loan				
First loan dummy	2.E-04	0.13	0.00	0.9986
Expand business dummy	1.14	0.16	50.30	0.0001
Stay in business dummy	0.22	0.21	1.09	0.2971
Other use dummy	0.76	0.17	19.60	0.0001
Firm characteristics				
Owner-manager dummy	0.73	0.18	17.53	0.0001
Family ownership dummy	-0.33	0.14	5.76	0.0164
Age of firm	-0.01	0.00	15.53	0.0001
Bank/loan characteristics				
Bank/S&L Concentration	0.05	0.07	0.53	0.4669
Lending relationship length	0.06	0.01	42.83	0.0001
Loan amount	-4.E-06	0.00	120.36	0.0001
Loan term	4.E-04	0.00	0.22	0.6392
Collateral Dummy	-0.56	0.21	7.13	0.0076
Financial ratios				
Operating profit	6.E-07	0.00	15.90	0.0001
Log of total assets	-0.20	0.07	9.57	0.0020
Times interest earned	0.01	0.01	2.07	0.1498
Debt to equity ratio	-3.E-03	0.00	3.28	0.0700
Ownership structure				
S-corporation dummy	-0.16	0.17	0.92	0.3365
Partnership dummy	-1.25	0.30	17.11	0.0001
C-corporation dummy	0.02	0.13	0.03	0.8692
Type of Loan				
Mortgage	0.03	0.21	0.02	0.9020
Vehicle	-1.44	0.19	57.20	0.0001
Equipment	-0.18	0.19	0.90	0.3423
Other loan type	-1.16	0.20	34.51	0.0001
Industry Variables				
Construction	0.07	0.25	0.09	0.7649
Manufacturing	0.29	0.17	3.02	0.0820
Retail	0.61	0.14	19.13	0.0001
Wholesale	1.13	0.18	37.80	0.0001
Transportation	-0.19	0.25	0.57	0.4495

lower interest rates.

The final group of variables considered, the bank and loan characteristics category indicates that firms with longer lending relationships must pay higher rates of interest; the larger the loan, the lower the rate charged; and firms that pledge collateral incur lower rates. The lending relationship result is contrary to the existing lending relationship literature (e.g., Petersen and Rajan (1994), Berger and Udell (1995), and Cole (1999)). Once again, we rely on the explanation that our sample of SBA loans differs from the samples

in the existing literature. Even with this sample explanation, we find this result very peculiar and surprising.

The last four groups of variables are again used to control for various factors. At least one, and usually two of the control variables in each group are significant, indicating that they are adequately controlling for their respective economic factors.

Determinants of Collateral

The final analysis we conduct considers the use of collateral in SBA guaranteed loans. To explore the collateral determinants, we estimate a logistical regression model. It is necessary to use a logistic regression methodology because the dependent variable is a binary choice indicator that equals one when the borrower pledges collateral and zero otherwise. The independent variables are as listed in the first column of Table 16.

The results reported in Table 16 indicate that the firm's use of the loan is a significant factor in the requirement of collateral. When the SBA guaranteed loan is the first loan the firm has ever received, it must pledge collateral more often. This finding is consistent with the idea that young firms are riskier than established firms and as such must pledge collateral as a form of insurance to the lender. Firms that intend to use the SBA loan to expand the business must offer collateral relative to firms that intend to use the loan to begin the business. When firms expand, they tend to buy additional assets. It follows that these additional assets must be pledged as a form of collateral. Finally firms that intend to use the loan to stay in business have a negative coefficient.

The second group of economic factors, firm characteristics, also has a significant impact on the incidence of collateral. Firms that are managed by the owner must pledge less collateral consistent with the agency explanations of Jensen and Meckling (1976). The results also indicate that family owned firms and older firms are associated with a higher incidence of collateral.

The final group of determinants discussed is composed of the bank and loan characteristic variables. These findings indicate that the institutional concentration, the lending relationship, the loan amount, and the loan term are all positively related to the collateral requirement. In addition to these variables, many of the control variables also have coefficients significantly different from zero. One interesting note is that corporations must pledge collateral more often than partnerships and proprietorships. This finding is consistent with the idea that lenders require a collateral stake from corporations due to their limited legal liability.

IV. SUMMARY AND CONCLUSION

In this paper, we have provided a rigorous analysis of a sample of over 350 small businesses that received an SBA guaranteed loan in 1986. We feel the results of this paper may be beneficial to entrepreneurs who are interested in obtaining SBA guaranteed loans. Specifically, we carefully describe the types of firms in our sample — a sample of firms that have successfully obtained an SBA guaranteed loan. Next, we test for determinants that impact the time it takes for an entrepreneur to receive an SBA loan, the SBA loan rate, and the requirement of collateral in SBA loans. We include variables that serve as proxies for the economic factors of the firm's use of the loan, firm ownership characteristics, financial institution and loan characteristics, firm financial ratios, ownership structure of the firm, type of loan, and industry of the borrower.

We find that SBA guaranteed loans are a valuable source of external financing for entrepreneurs. Our tests indicate that SBA guarantees substitute for entrepreneur's personal collateral. Additionally, we report that the availability of SBA loans and SBA loan assistance from institutions are important reasons why entrepreneurs choose their lender. On average, nearly half of the firms that receive SBA guaranteed loans must seek additional external financing within the next two years. Firms in our sample do not display the same significant relationships between proxies for agency costs and owner-manager and monitoring explanatory variables as other samples of borrowing firms. Finally, variables from each of the economic factor groups listed in the preceding paragraph significantly explain the number of days to obtain the SBA loan, the SBA loan rate, and the requirement of collateral with the SBA loan.

Table 16
Logistic Regression of Collateral for Sample of SBA Guaranteed Loans

Variable	Estimated Coefficient	Standard Error	Chi-Square	p-value
Intercept	2.87	0.99	8.31	0.0039
Firm's use of loan				
First loan dummy	1.49	0.18	70.51	0.0001
Expand business dummy	0.92	0.21	18.66	0.0001
Stay in business dummy	-0.51	0.26	3.93	0.0475
Other use dummy	-0.28	0.21	1.91	0.1671
Firm characteristics				
Owner-manager dummy	-0.65	0.30	4.73	0.0296
Family ownership dummy	0.34	0.17	4.20	0.0404
Age of firm	0.03	0.01	35.22	0.0001
Bank/loan characteristics				
Bank/S&L Concentration	0.72	0.09	64.28	0.0001
Lending relationship length	0.05	0.01	13.65	0.0002
Loan amount	2.E-06	0.00	32.67	0.0001
Loan term	0.01	0.00	53.71	0.0001
Financial ratios				
Operating profit	2.E-07	0.00	4.98	0.0256
Log of total assets	-0.19	0.08	5.88	0.0153
Times interest earned	-0.02	0.00	16.35	0.0001
Debt to equity ratio	-0.01	0.00	14.45	0.0001
Ownership structure				
S-corporation dummy	0.64	0.18	12.38	0.0004
C-corporation dummy	0.63	0.16	15.58	0.0001
Type of Loan				
Line of credit	-2.25	0.15	226.98	0.0001
Industry Variables				
Construction	-0.43	0.30	2.03	0.1546
Manufacturing	-1.31	0.21	37.60	0.0001
Retail	-2.25	0.20	131.34	0.0001
Wholesale	-1.95	0.23	72.07	0.0001
- 2 Log Likelihood			956.21	0.0001

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